



Original Article

Effect of Vitamin D Deficiency on Hypocalcaemia After Total Thyroidectomy due to Benign Goiter[☆]

Manuel Díez,^{a,*} Cristina Vera,^a Tomás Ratia,^a Lucía Diego,^a Fernando Mendoza,^a Paloma Guillamot,^a Rosario San Román,^a José M. Mugüerza,^a Ángel Rodríguez,^a Carlos Medina,^a Beatriz Gómez,^b Javier Granell^a

^aServicio de Cirugía General, Hospital Universitario Príncipe de Asturias, Universidad de Alcalá de Henares, Madrid, Spain

^bServicio de Análisis Clínicos, Hospital Universitario Príncipe de Asturias, Universidad de Alcalá de Henares, Madrid, Spain

ARTICLE INFO

Article history:

Received 28 April 2012

Accepted 5 September 2012

Available online 9 October 2013

Keywords:

Vitamin D

Parathormone

Hypovitaminosis D

Thyroidectomy

Benign goiter

Postoperative hypocalcemia

A B S T R A C T

Introduction: The purpose of this study was to analyze the relationship between preoperative serum levels of vitamin D and postoperative hypocalcemia after total thyroidectomy.

Material and methods: A prospective observational study was conducted on 113 patients treated by total thyroidectomy due to benign disease. Preoperative vitamin D serum levels and postoperative albumin-corrected calcium and parathormone (PTH) levels were determined. Sensitivity, specificity, positive predictive value and negative predictive value of vitamin D and PTH levels, respectively, in the diagnosis of postoperative hypocalcemia were calculated.

Results: Hypocalcemia was diagnosed in 44 (38.9%) patients. Vitamin D levels were significantly higher in the group of patients with normal postoperative calcium (median: 25.4 pg/mL; range: 4–60), compared to those who developed hypocalcemia (median: 16.4 pg/mL; range: 6.3–46.9) ($P=0.001$). Postoperative hypocalcemia was more frequent in patients with vitamin D < 30 ng/mL (39/78) (50%), than among those with normal levels (5/35) (14.2%) ($P=0.001$). Sensitivity, specificity, positive predictive value and negative predictive value were 88% and 68%, 43% and 82%, 50% and 71%, and 85% and 80% for vitamin D and PTH, respectively. Vitamin D and PTH showed independent prognostic values on the risk of hypocalcemia. The OR associated with vitamin D < 30 ng/mL was 4.25 (95% CI: 1.31–13.78) ($P=0.016$), and the OR of PTH < 13 pg/mL was 15.4 (95% CI: 4.83–49.1) ($P<0.001$).

Conclusion: Vitamin D deficiency is a risk factor of hypocalcemia after total thyroidectomy for benign goiter. The vitamin D level provides independent prognostic information, which is complementary to that given by PTH.

© 2012 AEC. Published by Elsevier España, S.L. All rights reserved.

[☆] Please cite this article as: Díez M, Vera C, Ratia T, Diego L, Mendoza F, Guillamot P, et al. Efecto de la deficiencia de vitamina D sobre la hipocalcemia tras tiroidectomía total por bocio benigno. Cir Esp. 2013;91:250–256.

* Corresponding author.

E-mail address: mdiez.hupa@salud.madrid.org (M. Díez).

2173-5077/\$ – see front matter © 2012 AEC. Published by Elsevier España, S.L. All rights reserved.

Efecto de la deficiencia de vitamina D sobre la hipocalcemia tras tiroidectomía total por bocio benigno

RESUMEN

Palabras clave:

Vitamina D
Hormona paratiroidea
Hipovitaminosis D
Tiroidectomía
Bocio benigno
Hipocalcemia postoperatoria

Introducción: El objetivo de este estudio fue analizar la relación entre concentración sérica preoperatoria de vitamina D y la hipocalcemia tras tiroidectomía total.

Material y métodos: Estudio prospectivo observacional que incluyó a 113 pacientes operados de tiroidectomía total por enfermedad benigna. Se determinaron las concentraciones preoperatorias de vitamina D y las concentraciones postoperatorias de calcio corregido por albúmina y hormona paratiroidea intacta (PTH). Se calcularon la sensibilidad, especificidad, valor predictivo positivo y valor predictivo negativo de los niveles de vitamina D y PTH para diagnosticar la hipocalcemia postoperatoria.

Resultados: De los 113 pacientes, 44 (38,9%) presentaron hipocalcemia. La concentración preoperatoria de vitamina D fue superior en el grupo de pacientes con calcemia postoperatoria normal (mediana: 25,4 ng/mL; rango: 4-60) que en los que desarrollaron hipocalcemia (mediana: 16,4 ng/mL; rango: 6,3-46,9) ($p = 0,001$). La hipocalcemia fue más frecuente en los pacientes con vitamina D < 30 ng/mL (39/78) (50%) que en aquellos con vitamina D normal (5/35) (14,2%) ($p = 0,001$). La sensibilidad, especificidad, valor predictivo positivo y valor predictivo negativo de la vitamina D y la PTH fueron 88 y 68%, 43 y 82%, 50 y 71%, 85 y 80%, respectivamente. La vitamina D y la PTH mostraron valor pronóstico independiente. La odds ratio de hipocalcemia para la vitamina D < 30 ng/mL fue 4,25 (IC 95%: 1,31-13,78) ($p = 0,016$), inferior a la asociada con PTH < 13 pg/mL, 15,4 (IC 95%: 4,83-49,1) ($p < 0,001$).

Conclusión: La vitamina D es un factor de riesgo de aparición de hipocalcemia postoperatoria tras tiroidectomía total por bocio benigno. El nivel de vitamina D proporciona información predictiva independiente y complementaria a la aportada por la PTH.

© 2012 AEC. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Introduction

Total thyroidectomy (TT) is the procedure of choice for the surgical treatment of benign multinodular goiter. Postoperative hypocalcemia is the most frequent complication. It is usually mild and transitory (in up to 50% of cases) and rarely permanent (5%). Nevertheless, it is always a concern and a challenge for surgeons, and for patients it entails the need for additional treatment.^{1,2}

The etiology of postoperative hypocalcemia is multifactorial, although the most important component is surgical trauma to the parathyroid glands. TT may cause hypoparathyroidism due to the unnoticed removal of the parathyroid gland or damage to its blood supply. Several factors influence surgical trauma: experience of the surgeon, careful tissue manipulation, number of parathyroid glands detected and preserved, and extent of the surgical exeresis (intrathoracic goiter, central lymphadenectomy, reinterventions).¹⁻³ Recent studies have highlighted the role of parathyroid hormone (PTH) levels as a predictive factor for post-thyroidectomy hypocalcemia.⁴⁻⁸ PTH concentrations are an indicator of the volume of functioning parathyroid tissue and objectively indicate the effect of surgery on parathyroid glands.

It has been observed that vitamin D deficiency favors the appearance of postoperative hypocalcemia in patients who undergo surgery for multinodular goiter or Graves'-Basedow disease.⁹⁻¹² Vitamin D plays a central role in the homeostasis of calcium,¹³⁻¹⁵ favors the intestinal absorption of calcium and

phosphate, diminishes the secretion of PTH and stimulates the differentiation of osteoclasts.^{13,14} The organism synthesizes its active form in the kidneys (1-25[OH]D₃) through a process controlled by PTH, and therefore, by increasing vitamin D levels, the secretion of PTH is reduced. If this connection between preoperative vitamin D deficiency and postoperative hypocalcemia is confirmed, vitamin D levels could be a good indicator of this risk that could be easy to measure and correct before surgery.

The objective of the present study was to analyze the value of preoperative vitamin D as an indicator of risk for developing hypocalcemia after TT due to benign goiter and to compare the results with those provided by clinical data and by PTH determination.

Material and Methods

We present a prospective, observational study of risk factors and evaluation of diagnostic tests, carried out between December 2009 and December 2011 in the General Surgery Department at the Hospital Príncipe de Asturias in Alcalá de Henares, Spain.

Considered for study were those patients who underwent TT due to benign thyroid disease. We did not include patients who were treated for thyroid cancer or those who presented concomitant parathyroid disease, or those who underwent reintervention for the total removal of the gland. A total of 136 patients participated in the study, 23 of whom were later

Download English Version:

<https://daneshyari.com/en/article/4255251>

Download Persian Version:

<https://daneshyari.com/article/4255251>

[Daneshyari.com](https://daneshyari.com)